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ABSTRACTS BOOK

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N571: Visualisation of bio-interaction between noble metals' nanoparticles and bacteria *Salmonella Enteridídis* (G-) and *Listeria monocytogenes* (G+)

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The objective of experiments was to assess morphology of bio-relation of noble metals' nanoparticles (Cu, Ag, Au, and Pt) and bacteria, visualized with transmission electron microscope. Hydrocolloids of Cu, Ag, Au and Pt, obtained from Nano-Tech, Poland were produced by electric non-explosive method (Polish patent 380649). Pure bacteria: *Salmonella Enteridídis* (G-) and *Listeria monocytogenes* (G+) were dissolved in redistilated water. Immediately after bacteria were aliquoted, they were mixed into test-tubes with hydrocolloids of Cu, Ag, Au, and Pt nanoparticles (each at a concentration of 50 ppm), in proportion 1:1. Samples of Cu, Ag, Au and Pt, solutions of nanoparticles with bacteria and pure bacteria as controls were prepared by placing droplets on copper, formvared grid (Agar Scientific Ltd., Stansted, UK). Immediately after drying of the droplets in dry air, grids were inserted into transmission electron microscope (TEM) (JEOL model JEM-2000EX). Morphology of bacteria and localisation of nanoparticles were inspected by TEM. Salmonella (G-) and Listeria (G+), as well as type of metals affected obtained pictures. Affinity of Ag to cell's wall (seen as a chain of nanoparticles located around each cell) of *Listeria* but not *Salmonella* was demonstrated. Also some nanoparticles were seen inside *Salmonella* but not *Listeria*. Gold nanoparticles were aggregated and surrounded by cells of *Listeria* but not by *Salmonella*. Effect of Pt nanoparticle on *Listeria* and *Salmonella* morphology was similar, showing release of mesosomes from bacteria cell's. Cu nanoparticles destroyed cell's wall, and also were attached to biofilm of bacteria. The present results indicate that both distribution and behaviour of nanoparticles depend on metals and kind of bacteria exposed to the nanoparticles.